Introduction

A number of therapeutic approaches have been performed for primary varicose veins of the lower extremities. Endovenous laser treatment (EVLT) is a new, minimally invasive technique for varicose veins in recent years. The good short-term efficacy of EVLT has been reported. Complications after EVLT include ecchymosis, paresthesias, superficial thrombophlebitis, skin burns, pigmentation, pain, deep vein thrombosis and pulmonary embolism.

A transient thrombocytosis has been found following EVLT of the great saphenous vein (GSV). This is a case report of a rare complication with a review of the literature.

Case Report

A 54-year-old man with edema and pain of the left lower extremity was referred to our department. He had not presented with any remarkable medical history or family history. His physical examination showed a body height of 174 cm, with a body weight of 62 kg; palpebral conjunctivae were neither anemic nor icteric. Left great saphenous varicose veins (clinical, etiologic, anatomic, and pathophysiologic [CEAP] classification: C3) were found. Blood test findings showed no remarkable abnormalities. The white blood cell count (WBC) and C-reactive protein (CRP) were normal at 5800 /mm3 and 0.07 mg/dL, respectively, prior to the EVLT procedure (Fig. 1).

Transmitting thrombocytosis after Endovenous Laser Treatment for Primary Varicose Vein of the Lower Extremity

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We presented a case of a completely occluded great saphenous vein and transient thrombocytosis following endovenous laser treatment (EVLT) for primary varicose veins of the lower extremity. A 54-year-old man with a left saphenous varicose vein underwent EVLT surgery. Twelve-watt laser irradiation was delivered over the length of 33 cm of the saphenous vein. The cumulative exposure was 1042 J. Nine days after treatment, the platelet count increased up to $610 \times 10^3$ /mm3 and returned to normal after 2 months. A complete occlusion of the great saphenous vein commonly occurs after EVLT, but no case of transient thrombocytosis has been reported.

Key words: endovenous laser treatment, thrombocytosis, varicose vein

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of operation was 32 minutes. Color Doppler ultrasonography immediately after the irradiation revealed a patent superficial epigastric vein with blood flow blocked at a site 9.7 mm distal to the SFJ (Fig. 2). These procedures were conducted in a 1-day surgical setting.

During his visit on the second postoperative day, he presented with ecchymosis of the left femoral region without inflammatory findings, such as superficial thrombophlebitis.

Color Doppler ultrasonography revealed occlusion of the superficial epigastric vein and complete thrombotic occlusion of the great saphenous vein beginning at the SFJ. There was no protrusion of thrombus inside the femoral vein. The platelet count was 292000 /mm$^3$.

The WBC was almost unchanged at 5900 /mm$^3$, while the CRP slightly increased to 0.24 mg/dL, albeit

![Fig. 1](image1.png)

**Fig. 1** Changes in platelet counts, white blood cell counts, and C-reactive protein levels after treatment.

WBC, white blood cell count; PLT, platelet count; CRP, C-reactive protein; Pre, preoperative

![Fig. 2](image2.png)

**Fig. 2** Ultrasonographic image immediately after endovenous laser treatment, showing incomplete occlusion of the great saphenous vein up to the level of the SFJ.

SFJ, sapheno-femoral junction; CFV, common femoral vein; GSV, great saphenous vein
within the normal range, as compared with baseline values (Fig. 1).

On the 9th postoperative day, marked thrombocytosis was observed with a platelet count of 610000 /mm$^3$. The WBC was 6700 /mm$^3$, and CRP was 0.08 mg/dL, both of which were within the normal ranges (Fig. 1). No remarkable inflammatory findings, such as superficial thrombophlebitis were observed.

Ultrasonography revealed the same findings as those observed previously: occlusion of the superficial epigastric vein, complete thrombotic occlusion of the great saphenous vein beginning at the SFJ, and no protrusion of thrombus inside the femoral vein (Fig. 3).

Test results for TAT and D-dimer were normal, and no respiratory symptoms were observed. By 2 months, the platelet count had returned to normal (Fig. 1).

Three months after surgery, air plethysmography revealed a normal VFI. No recurrence has been noted for 1 year after surgery.

**DISCUSSION**

Thrombocytosis is a physiological or pathological increase in the platelet count from 400000 /mm$^3$ or higher.$^5$ Thrombocytosis is classified into 3 types: myeloproliferative disorder, reactive thrombocytosis, and familial thrombocytosis. A search for causes revealed that reactive thrombocytosis constituted the largest proportion of cases at 82%, whereas myeloproliferative disorder accounted for only 14% of the cases.$^6$ In our patient, myeloproliferative disorder and familial thrombocytosis were ruled out by family history and clinical course. Reactive thrombocytosis was considered most likely. Since platelet recovery required approximately 2 months, this reactive thrombocytosis did not appear to have been a result of outflow from the platelet storage pool after exercise or administration of epinephrine. It was probably caused by increased platelet production.

Reactive thrombocytosis can be associated with a wide variety of underlying diseases, and there have been reports of local interleukin (IL)-6 production due to photocoagulation for retinopathy$^7$ and increased serum IL-6 in approximately 80% of the patients with reactive thrombocytosis.$^8$ Serum IL-6 was not measured in our patient, though it appeared that the thrombocytosis had been triggered by increased inflammatory cytokine IL-6, which is secreted in response to tissue disorder caused by heat injury from laser irradiation.

A CRP elevation, albeit slight in degree, was observed on the second postoperative day (Fig. 1). CRP is a protein induced by IL-6 in the liver. IL-6 might have been produced as inflammatory reactions to laser irradiation, resulting in thrombocytosis. However, since the increased CRP value was within the normal range, other reasons cannot be entirely ruled out.

There was only 1 report$^9$ on thrombocytosis associated...
with leukocytosis and hyperkalemia after intralesional laser photocoagulation (ILP) for vascular malformation, but no reports on thrombocytosis after EVLT for primary lower-extremity varicose vein. In the reported case of post-ILP thrombocytosis, a 1064-nm Nd:YAG laser was used with a laser power of 15 W and radiation energy of 51150 J. This treatment was presumed to have caused much more severe tissue disorder from heat injury than that in our patient, and release of potassium, an intracellular electrolyte, due to the extensive tissue destruction probably resulted in concomitant hyperkalemia and leukocytosis. In this case, the platelet count became normalized 6 days after surgery, whereas the thrombocytosis in our patient persisted for 2 months after surgery. The prolongation of thrombocytosis for as long as 2 months after the procedure might be due to distribution of the products of tissue damage over the entire body through the general circulation, which were produced by laser irradiation in the vein close to the general circulation.

Generally, in patients with reactive thrombocytosis, the platelet count does not exceed 1000000 /mm³, and secondary thrombosis is unlikely to occur. In our patient as well, the maximum count was 610000 /mm³, and no other thrombosis was observed. He recovered during follow-up without use of drugs such as Bayaspirin (aspirin) with a good prognosis.

**CONCLUSION**

We experienced a case of transient thrombocytosis after endovenous laser treatment for primary varicose veins of the lower extremity. This is the first case report of such an event in the literature. The patient recovered after the follow-up period of 2 months with a favorable prognosis.

**REFERENCES**